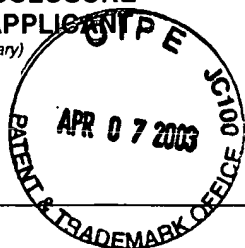


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Application Number 10/081818

Filing Date February 20, 2002

First Named Inventor Eldridge, Jerome

Group Art Unit 2818

Examiner Name Ho, Tu-Tu

Sheet 1 of 5

Attorney Docket No: 1303.045US1

US PATENT DOCUMENTS

| Examiner Initial * | USP Document Number | Publication Date | Name of Patentee or Applicant of cited Document | Class | Subclass | Filing Date If Appropriate |
|--------------------|---------------------|------------------|---|-------|----------|----------------------------|
| TH | US-2001/0013621 | 08/01/2001 | Kazuo, Nakazato | 257 | 314 | 12/08/2000 |
| | US-4,295,150 | 10/13/1981 | Adam, Fritz | 357 | 54 | 10/01/1979 |
| | US-4,412,902 | 11/01/1983 | Michikami, Osamu , et al. | 204 | 192 | 06/18/1982 |
| | US-4,757,360 | 07/12/1988 | Faraone, Lorenzo , et al. | 257 | 317 | 07/06/1983 |
| | US-4,780,424 | 10/25/1988 | Holler, M. | 437 | 29 | 09/28/1987 |
| | US-5,691,230 | 11/25/1997 | Forbes, L. | 437 | 62 | 09/04/1996 |
| | US-5,071,782 | 12/10/1991 | Mori, Kiyoshi | 437 | 48 | 06/28/1990 |
| | US-5,073,519 | 12/01/1991 | Rodder, Mark | 438 | 269 | |
| | US-5,350,738 | 09/27/1994 | Hase, Takashi , et al. | 505 | 473 | 11/27/1992 |
| | US-5,399,516 | 03/21/1995 | Bergendahl, A , et al. | 437 | 43 | 09/21/1992 |
| | US-5,418,389 | 05/23/1995 | Watanabe, Y. | 257 | 295 | 11/09/1993 |
| | US-5,498,558 | 03/12/1996 | Kapoor, A | 437 | 43 | 05/06/1994 |
| | US-5,508,544 | 04/16/1996 | Shah, P. L. | 257 | 316 | 09/27/1994 |
| | US-5,600,592 | 02/04/1997 | Atsumi, S. , et al. | 365 | 185.18 | 05/08/1995 |
| | US-5,618,575 | 04/08/1997 | Peter, Gunter | 427 | 8 | 04/21/1995 |
| | US-5,677,867 | 10/14/1997 | Hazani, E. | 365 | 185 | 06/30/1995 |
| | US-5,801,401 | 09/01/1998 | Forbes, L. | 257 | 77 | 01/29/1997 |
| | US-5,852,306 | 12/22/1998 | Forbes, Leonard | 257 | 315 | 01/29/1997 |
| | US-5,880,991 | 03/09/1999 | Hsu, L. , et al. | 365 | 182 | 04/14/1997 |
| | US-5,936,274 | 08/10/1999 | Forbes, L. , et al. | 257 | 315 | 07/08/1997 |
| | US-5,981,350 | 11/09/1999 | Geusic, J. E., et al. | 438 | 386 | 05/29/1998 |
| | US-5,986,932 | 11/16/1999 | Ratnakumar, K. N., et al. | 365 | 185.07 | 06/30/1997 |
| | US-5,991,225 | 11/23/1999 | Forbes, L. , et al. | 365 | 230.06 | 02/27/1998 |
| | US-6,025,228 | 02/15/2000 | Ibok, E. , et al. | 438 | 261 | 11/25/1997 |
| | US-6,025,627 | 02/15/2000 | Forbes, L. , et al. | 257 | 321 | 05/29/1998 |
| | US-6,031,263 | 02/29/2000 | Forbes, L. , et al. | 257 | 315 | 07/29/1997 |
| | US-6,069,380 | 05/01/2000 | Chou, , et al. | 257 | 315 | |
| | US-6,069,816 | 05/30/2000 | Nishimura, Kiyoshi | 365 | 145 | 11/24/1998 |
| | US-6,124,729 | 09/26/2000 | Noble, W. P., et al. | 326 | 41 | 02/27/1998 |
| | US-6,141,238 | 10/31/2000 | Forbes, L. , et al. | 365 | 145 | 08/30/1999 |
| | US-6,141,248 | 10/31/2000 | Forbes, Leonard , et al. | 365 | 185.08 | 07/29/1999 |
| | US-6,143,636 | 11/07/2000 | Forbes, L. , et al. | 438 | 587 | 08/20/1998 |
| | US-6,163,049 | 12/19/2000 | Bui, N. D. | 257 | 321 | 10/13/1998 |
| | US-6,208,164 | 03/27/2001 | Noble, W. P., et al. | 326 | 41 | 08/04/1998 |
| TH | US-6,229,175 | 05/08/2001 | Uchida, Hidetsugu | 257 | 315 | 03/19/1999 |

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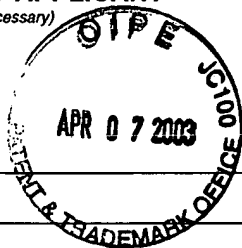
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| Filing Date | February 20, 2002 |
| First Named Inventor | Eldridge, Jerome |
| Group Art Unit | 2818 |
| Examiner Name | Ho, Tu-Tu |

Attorney Docket No: 1303.045US1

| | | | | | | |
|----|--------------|------------|-------------------------|-----|--------|------------|
| TH | US-6,238,976 | 05/29/2001 | Noble, W. P., et al. | 438 | 259 | 02/27/1998 |
| I | US-6,246,606 | 06/12/2001 | Forbes, Leonard, et al. | 365 | 185.03 | 09/02/1999 |
| I | US-6,249,460 | 06/19/2001 | Forbes, L., et al. | 365 | 185.28 | 02/28/2000 |
| TH | US-6,424,001 | 07/23/2002 | Forbes, L., et al. | 257 | 315 | 02/09/2001 |

FOREIGN PATENT DOCUMENTS

| Examiner Initials* | Foreign Document No | Publication Date | Name of Patentee or Applicant of cited Document | Class | Subclass | T ² |
|--------------------|---------------------|------------------|---|-------|----------|----------------|
|--------------------|---------------------|------------------|---|-------|----------|----------------|

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

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|--------------------|----------------------|---|----------------|
| TH | | AARIK, JAAN, et al., "Anomalous effect of temperature on atomic layer deposition of titanium oxide", <u>Journal of Crystal Growth</u> , (2000), pp. 531-537 | |
| | | AARIK, JAAN, et al., "Texture development in nanocrystalline hafnium dioxide thin films grown by atomic layer deposition", <u>Journal of Crystal Growth</u> , (2000), pp. 105-113 | |
| | | AFANAS'EV, V, et al., "Electron energy barriers between (100)Si and ultrathin stacks of SiO ₂ , Al ₂ O ₃ , and ZrO ₃ and ZrO ₂ insulators", <u>Applied Physics Letters</u> , 78(20), (2001), pp. 3073-3075 | |
| | | ARYA, S., et al., "Conduction Properties of Thin Al ₂ O ₃ Films", <u>Thin Solid Films</u> , 91, (1982), pp. 363-374 | |
| | | DIPERT, BRIAN, et al., "Flash Memory Goes Mainstream", <u>IEEE Spectrum</u> , 30, (October 1993), pp. 48-52 | |
| | | EIERDAL, L., et al., "Interaction of oxygen with Ni(110) studied by scanning tunneling microscopy", <u>Surface Science</u> , 312, (1994), pp. 31-53 | |
| | | ELDRIDGE, J., et al., "Analysis of Ultrathin Oxide Growth on Indium", <u>Thin Solid Films</u> , 12, (1972), pp. 447-451 | |
| | | ELDRIDGE, J., et al., "Measurement of Tunnel Current Density in a Metal-Oxide-Metal System as a Function of Oxide Thickness", <u>Proc. 12th Intern. Conf. on Low Temperature Physics</u> , (1971), pp. 427-428 | |
| | | ELDRIDGE, J.M., et al., "The Growth of Thin PbO Layers on Lead Films", <u>Surface Science Vol. 40</u> , (1973), 512-530 | |
| | | FERGUSON, J D., et al., "Atomic layer deposition of Al ₂ O ₃ and SiO ₂ on BN particles using sequential surface reaction", <u>Applied Surface Science</u> , (2000), pp. 280-292 | |
| | | GREINER, J., "Josephson Tunneling Barriers by rf Sputter Etching in an Oxygen Plasma", <u>Journal of Applied Physics</u> , vol. 42, no. 12, (November 1971), 5151-5155 | |
| | | GREINER, J., "Oxidation of lead films by rf sputter etching in an oxygen plasma", <u>Journal of Applied Physics</u> , 45(1), (1974), pp. 32-37 | |
| TH | | GRIMBOLT, J., "I. Interaction of Al Films with O ₂ at Low Pressures", <u>Journal of</u> | |

EXAMINER

TU - TU +10

DATE CONSIDERED

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Substitute Disclosure Statement Form (PTO-1449)

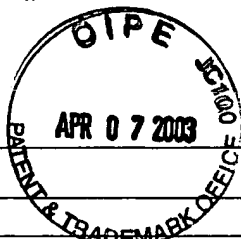
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| Application Number | 10/081818 |
| Filing Date | February 20, 2002 |
| First Named Inventor | Eldridge, Jerome |
| Group Art Unit | 2818 |
| Examiner Name | Ho, Tu-Tu |

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|-----------------------|--------------------------|--|----------------|
| (THP) | | the Electrochemical Society, 129(10), (1982), pp. 2366-2368 | |
| THP | | GRIMBOLT, J. , "II. Oxidation of Al Films", <u>Journal of Electrochem Soc.: Solid-State Science and Technology</u> , (1982), pp. 2369-2372 | |
| | | GUNDLACH, K. , et al., "Logarithmic Conductivity of Al-Al ₂ O ₃ -Al Tunneling Junctions Produced by Plasma and by Thermal Oxidation", <u>Surface Science</u> , 27, (1971), pp. 125-141 | |
| | | GUO, X. , "High Quality Ultra-thin (1.5 nm) TiO ₂ /Si ₃ N ₄ Gate Dielectric for Deep Sub-micron CMOS Technology", <u>IEDM Technical Digest</u> , (1999), pp. 137-140 | |
| | | HURYCH, Z. , "Influence of Non-Uniform Thickness of Dielectric Layers on Capacitance and Tunnel Currents", <u>Solid-State Electronics</u> , vol. 9, (1966), 967-979 | |
| | | ITOKAWA, H , "Determination of Bandgap and Energy Band Alignment for High-Dielectric-Constant Gate Insulators Using High-Resolution X-ray Photoelectron Spectroscopy", <u>Extended Abstracts of the 1999 International Conference on Solid State Devices and Materials</u> , (1999), pp. 158-159 | |
| | | KIM, YONG S., et al., "Effect of rapid thermal annealing on the structure and the electrical properties of atomic-layer-deposited Ta ₂ O ₅ films", <u>Journal of the Korean Physical Society</u> , (December 2000), pp. 975-979 | |
| | | KIM, H. , "Leakage current and electrical breakdown in metal-organic chemical vapor deposited TiO ₂ dielectrics on silicon substrates", <u>Applied Phys. Lett.</u> , 69(25), (1996), pp. 3860-3862 | |
| | | KIM, YEONG K., et al., "Novel capacitor technology for high density stand-alone and embedded DRAMs", <u>IEEE</u> , (2000), four pages | |
| | | KUBASCHEWSKI, O. , et al., <u>Oxidation of Metals and Alloys, Second Edition</u> , Butterworths, London, (1962), pp. 1-3, 5, 6, 8-12, 24, 36-39 | |
| | | KUBASCHEWSKI, O. , et al., <u>Oxidation of Metals and Alloys</u> , Butterworths, London, (1962), pp. 53-63 | |
| | | KUKLI, KAUPU , "Atomic Layer Deposition of Titanium Oxide from TiI ₄ and H ₂ O ₂ ", <u>Chemical Vapor Deposition</u> , (2000), pp. 303-310 | |
| | | KUKLI, KAUPU , et al., "Atomic layer deposition of zirconium oxide from zirconium tetraiodide, water and hydrogen peroxide", <u>Journal of Crystal Growth</u> , (2001), pp. 262-272 | |
| | | KUKLI, K. , "Development of Dielectric Properties of Niobium Oxide, Tantalum Oxide, and Aluminum Oxide Based Nanolayered Materials", <u>Journal of the Electrochemical Society</u> , 148(2), (2001), pp. F35-F41 | |
| | | KUKLI, KAUPU , et al., "Real-time monitoring in atomic layer deposition of TiO ₂ from TiI ₄ and H ₂ O-H ₂ O ₂ ", <u>American Chemical Society</u> , (2000), pp. 8122-8128 | |
| | | KWO, J. , "Properties of high k gate dielectrics Gd ₂ O ₃ and Y ₂ O ₃ for Si", <u>Journal of Applied Physics</u> , 89(7), (2001), pp. 3920-3927 | |
| THP | | LEE, J. , "Effect of Polysilicon Gate on the Flatband Voltage Shift and Mobility | |

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Substitute Disclosure Statement Form (PTO-1449)

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| Group Art Unit | 2818 |
| Examiner Name | Ho, Tu-Tu |

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OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

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|--------------------|----------------------|---|----------------|
| (TH) | | Degradation for ALD-Al ₂ O ₃ Gate Dielectric", <u>IEDM</u> , (2000),pp. 645-648 | |
| TH | | LUAN, H. , et al., "High Quality Ta ₂ O ₅ Gate Dielectrics with T _{ox,eq} <10A", <u>IEDM</u> , (1999),pp. 141-144 | |
| | | MA, Y. , "Zirconium Oxide Based Gate Dielectrics with equivalents Oxide Thickness of Less Than 1.0 nm and Performance of Submicron MOSFET using a Nitride Gate Replacement Process", <u>IEDM - Technical Digest</u> , (1999),pp. 149-152 | |
| | | MARSHALEK, R. , et al., "Photoresponse Characteristics of Thin-Film Nickel-Nickel Oxide-Nickel Tunneling Junctions", <u>IEEE Journal of Quantum Electronics</u> , QE-19(4), (1983),pp. 743-754 | |
| | | MASUOKA, F. , et al., "A 256K Flash EEPROM using Triple Polysilicon Technology", <u>IEEE International Solid-State Circuits Conference, Digest of Technical Papers</u> , (1985),pp. 168-169 | |
| | | MASUOKA, F. , et al., "A New Flash EEPROM Cell using Triple Polysilicon Technology", <u>International Electron Devices Meeting, Technical Digest</u> , San Francisco, CA,(1984),pp. 464-467 | |
| | | MORI, S. , et al., "Reliable CVD Inter-Poly Dielectrics for Advanced E&EEPROM", <u>Symposium on VLSI Technology, Digest of Technical Papers</u> , (1985),pp. 16-17 | |
| | | MULLER, H. , "Electrical and Optical Properties of Sputtered In ₂ O ₃ Films", <u>Physica Status Solidi</u> , 27(2), (1968),pp.723-731 | |
| | | PARANJPE, AJIT , et al., "Atomic layer deposition of AlOx for thin film head gap application", <u>Journal of the Electrochemical Society</u> , (September 2001),pp. 465-471 | |
| | | PASHLEY, R. , et al., "Flash Memories: the best of two worlds", <u>IEEE Spectrum</u> , (1989),pp. 30-33 | |
| | | POLLACK, S. , et al., "Tunneling Through Gaseous Oxidized Films of Al ₂ O ₃ ", <u>Transactions of the Metallurgical Society of AIME</u> , 233, (1965),pp. 497-501 | |
| | | QI, W , "MOSCAP and MOSFET characteristics using ZrO ₂ gate dielectric deposited directly on Si", <u>IEDM - Technical Digest</u> , (1999),pp. 145-148 | |
| | | ROBERTSON, J. , "Band offsets of wide-band-gap oxides and implications for future electronic devices", <u>Journal Vac. Sci. Technol. B</u> , 18(3), (2000),pp. 1785-1791 | |
| | | ROBERTSON, J. , et al., "Schottky Barrier height of Tantalum oxide, barium strontium titanate, lead titanate, and strontium bismuth tantalate", <u>Applied Physics Letters</u> , vol. 74, no. 8, (02/22/1999),1168-1170 | |
| | | SHI, Y. , et al., "Tunneling Leakage Current in Ultrathin (<4 nm) Nitride/Oxide Stack Dielectrics", <u>IEEE Electron Device Letters</u> , 19(10), (1998),pp. 388-390 | |
| TH | | SIMMONS, J. , "Generalized Formula for the Electric Tunnel Effect between Similiar Electrodes Separated by a Thin Insulating Film", <u>Journal of Applied Physics</u> , 34(6), (1963),pp. 1793-1803 | |

EXAMINER

TH - TH +10

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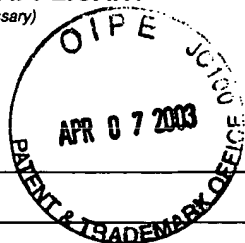
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|-----------------------|--------------------------|--|----------------|
| TH | | SMITH, RYAN C., et al., "Chemical vapour deposition of the oxides of titanium, zirconium and hafnium for use as high-k materials in microelectronic devices. A carbon-free precursor for the synthesis of hafnium dioxide", <u>Advanced Materials for Optics and Electronics</u> , (2000), two pages | |
| | | SWALIN, R., "Equilibrium between Phases of Variable Composition", <u>Thermodynamics of Solids, 2nd Edition</u> , (1972), pp. 165-180 | |
| | | SZE, S., <u>Physics of Semiconductor Devices, Second Edition</u> , John Wiley & Sons, New York, (1981), pp. 553-556 | |
| TH | | YAN, J., et al., "Structural and electrical characterization of TiO ₂ grown from titanium tetrakis-isopropoxide (TTIP) and TTIP/H ₂ O ambients", <u>Journal Vac. Sci. Technol. B</u> , 14(3), (1996), pp. 1706-1711 | |

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DATE CONSIDERED

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